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Report No: ICR00005579

IMPLEMENTATION COMPLETION AND RESULTS REPORT

TF TF016970 AND TF016748

ON A

GRANT FROM THE GLOBAL ENVIRONMENT FACILITY (GEF)

IN THE AMOUNT OF US$ 8.2MILLION

AND A

GRANT FROM THE COOPERATION IN INTERNATIONAL WATERS IN AFRICA TRUST FUND (CIWA)

IN THE AMOUNT OF US$ 2.00 MILLION

TO THE

SOUTHERN AFRICAN DEVELOPMENT COMMUNITY (SADC)

FOR A/THE

AFCRI-Sustainable Groundwater Management in SADC Member States

{December, 2021}

Water Global Practice

Africa East Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective {Oct 08, 2021})

Currency Unit = US$

FISCAL YEAR
July 1 - June 30

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ABBREVIATIONS AND ACRONYMS

AGW-Net	Africa Groundwater Network
BGR	German Bureau of Governmental Research
BGS	British Geological Survey
BUPUSA	Buzi-Pungwe-Save
CIWA	Cooperation in International Waters in Africa
CUVECOM	Cuvelai Commission
CWRAS	Country Water Resources Assistance Strategies
DRC	Democratic Republic of Congo
GEF	Global Environment Facility
GESI	Gender Equality and Social Inclusion
GMP	Groundwater Management Programme of Action
GWP-SA	Global Water Partnership-Southern Africa
IGRAC	International Groundwater Resources Assessment Center
IGS	Institute for Groundwater Studies
IUCN	International Union for the Conservation of Nature
IWRM	Integrated Water Resource Management
LIMCOM	Limpopo Commission
MOU	Memorandum of Understanding
NAPAs	National Adaptation Programmes for Action
NFGs	National Focal Groups
NGOs	Non-Governmental Organizations
NPC	Not-for-Profit Company
OKACOM	Okavango Commission
ORASECOM	Orange-Senqu Commission
PDO	Project Development Objective
PLI	Policy, Legal and Institutional
RBO	River Basin Organization
RIAS	World Bank Regional Integration Assistance Strategy for Sub-Saharan Africa
RSA	Republic of South Africa
RSAP	SADC Regional Strategic Action Plan for IWRM
RWP	SADC Regional Water Policy
SADC	Southern African Development Community
SADC-GLA	SADC Grey Literature Archive
SADC-GIP	SADC Groundwater Information Portal
SADC-GMI	Groundwater Management Institute
TBA	Transboundary Aquifers
TDA	Transboundary Diagnostic Analyses
UFS	University of Free State
UNESCO-IHP	UNESCO – Intergovernmental Hydrological Programme
USAID-RWP	United States Agency for International Development – Resilient Waters Programme
WBG	World Bank Group
WISH	Windows Information System for Hydrogeologists
WRTC	SADC Water Resources Technical Committee

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P127086	AFCRI-Sustainable Groundwater Management in SADC Member States
Country	**Financing Instrument**
Eastern Africa	Investment Project Financing
Original EA Category	**Revised EA Category**
Partial Assessment (B)	Partial Assessment (B)

Organizations

Borrower	Implementing Agency
SADC Secretariat	University of the Free State

Project Development Objective (PDO)

Original PDO

To support sustainable management of groundwater at national and transboundary levels across SADC Member States.

PDO as stated in the legal agreement

to support sustainable management of groundwater at national and transboundary levels across SADC Member States

FINANCING

	Original Amount (US$)	Revised Amount (US$)	Actual Disbursed (US$)
World Bank Financing			
TF-16970	8,200,000	8,200,000	8,198,451
TF-16748	2,000,000	2,000,000	1,999,999
Total	**10,200,000**	**10,200,000**	**10,198,450**
Non-World Bank Financing			
Borrower/Recipient	0	0	0
Total	**0**	**0**	**0**
Total Project Cost	**10,200,000**	**10,200,000**	**10,198,450**

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
24-Apr-2014	30-Jun-2015	22-Mar-2019	30-Jun-2019	30-Jun-2021

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US$M)	Key Revisions
29-Jan-2019	3.46	Change in Results Framework Change in Components and Cost Change in Loan Closing Date(s) Reallocation between Disbursement Categories Change in Implementation Schedule
20-Nov-2020	9.98	Change in Results Framework Change in Loan Closing Date(s)

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	Substantial

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US$M)
01	25-Feb-2015	Moderately Satisfactory	Moderately Satisfactory	0
02	08-Oct-2015	Moderately Satisfactory	Moderately Satisfactory	0
03	22-Jun-2016	Moderately Unsatisfactory	Moderately Unsatisfactory	0
04	06-Dec-2016	Moderately Unsatisfactory	Moderately Unsatisfactory	0
05	27-Jun-2017	Moderately Satisfactory	Moderately Satisfactory	1.23
06	08-Jan-2018	Moderately Satisfactory	Moderately Satisfactory	1.67
07	23-Sep-2018	Moderately Satisfactory	Moderately Satisfactory	2.83
08	08-Apr-2019	Satisfactory	Moderately Satisfactory	5.30
09	31-May-2019	Satisfactory	Moderately Satisfactory	5.30
10	01-Nov-2019	Satisfactory	Satisfactory	8.29
11	06-May-2020	Satisfactory	Satisfactory	8.29
12	31-May-2020	Satisfactory	Moderately Satisfactory	8.29
13	07-Nov-2020	Satisfactory	Moderately Satisfactory	9.98
14	04-May-2021	Satisfactory	Satisfactory	10.20
15	29-Jun-2021	Satisfactory	Satisfactory	10.20

SECTORS AND THEMES

Sectors

Major Sector/Sector	(%)
Agriculture, Fishing and Forestry	**10**
Irrigation and Drainage	10

Water, Sanitation and Waste Management	**90**
Water Supply	25
Public Administration - Water, Sanitation and Waste Management	65

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3)	(%)
Private Sector Development	**15**
Regional Integration	15
Environment and Natural Resource Management	**86**
Climate change	20
Mitigation	20
Environmental Health and Pollution Management	21
Air quality management	7
Water Pollution	7
Soil Pollution	7
Water Resource Management	45
Water Institutions, Policies and Reform	45

ADM STAFF

Role	At Approval	At ICR
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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Regional Context

1. **The Southern African Development Community (SADC) Region[1] has focused on water as key to economic growth, social development and environmental sustainability.** For decades, the SADC has pursued an integrated regional economy on the basis of balance, equity and mutual benefit for all its Member States. The SADC's average regional economic growth rate has been steady and increased from 4.9% to 5.2% from 2013 to 2015. Growth was expected to be anchored largely in agriculture and mining exports, with anticipated increases in manufacturing and primary industry activities and outputs. Translating the positive economic outlook into development outcomes requires measures to create jobs and invest in human wellbeing. Water is an indispensable basic need linked to the thriving of every sector in the SADC's economy, needed for sustainable and inclusive economic growth, for accelerating job creation, reducing poverty and improving access to essential services and food security. The mining sector, an important economic sector in many SADC Member States, is a significant water user and major water polluter. Additionally, hydropower is a vital source of energy in the region.

2. **Poverty is prevalent in Southern Africa, along with high inequality.** At appraisal, the economic development was uneven between and within SADC member countries. The mixed levels of development could be seen in access to basic water supply and sanitation and the Human Development Index, which ranges widely across the member countries. For example, access to improved water sources ranged from 47% in Mozambique, 64% in Zambia, and 97% in Botswana. The average life expectancy in Lesotho, the Democratic Republic of Congo (DRC), and Swaziland was less than 48 years, while in Namibia, Seychelles, and Mauritius, it was over 65 years.

3. **The SADC region is known for climatic variability that translates into recurring drought and flood conditions with varying frequency and magnitude—from the deserts of Namibia to the floodplains of Mozambique.** Recurring droughts of shallow groundwater cause social upheaval and distressed ecosystems, with over a third of the SADC's population living in drought-prone areas. In the driest areas across south-western Africa, groundwater has often been the only source of water bridging dry and rainy seasons. Climate change poses substantial challenges to water resource management. As climate variability affects surface water availability, groundwater has become the sole water source for many communities. Groundwater can play a key role in improving water security and supporting the region's economy through sustainable and inclusive economic growth, for accelerating job creation, reducing poverty, improving access to essential services, and for food security. Groundwater quality, however, has also been a concern, with localized aquifers contaminated by fertilizer-derived nutrients from expanding commercial agricultural activities. Water quality concerns are further exacerbated where mining and factories release heavy metals and sulphates, and where the widespread use of on-site sanitation in rural and urban areas contaminates shallow aquifers in fractured or karst bedrock with pathogens and nitrates.

[1] The region constitutes 16 Member States: Angola, Botswana, Comoros, Democratic Republic of Congo (DRC), Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia, and Zimbabwe

Sectoral and Institutional Context

4. Among different sources of water, groundwater is especially important for alleviating poverty through improving human wellbeing, livelihoods, food production, ecosystems, industries, and growing cities in the SADC Member States. Though dependence on groundwater varies between SADC Member States, in some areas, groundwater has provided a critical buffer between dry and rainy seasons. At project appraisal, it was estimated that over 70 percent of the people living in the SADC region relied on groundwater as their primary source of water. At appraisal, 40 percent of the region's population used water from unimproved sources, unsafe and prone to the effects of drought. There are about 30 shared aquifer systems in the SADC region, and SADC Member States experience similar groundwater challenges. Groundwater's role as key to economic growth was further exacerbated with expanding commercial farming and industries. In response to this dependency, some SADC Member States were actively integrating groundwater into their water resource management policies and laws.

5. **The project built upon the momentum, achievements, and lessons from the previous operation: the SADC Groundwater and Drought Management Project (GDMP, 2005-2011).** At project conception, the institutional frameworks to manage water at national and transboundary levels did not feature groundwater prominently. As a result, SADC Member States endorsed the SADC Secretariat's mandate to support national governments and transboundary cooperation on the management of groundwater resources. As part of this endorsement, Member States committed to establishing a regional center of excellence in groundwater to fulfil the critical function of promoting sustainable groundwater management at the national and transboundary level (including to develop the data and data management systems needed to generate decision making information on the potential of groundwater and its utilization). The SADC Groundwater Management Institute (GMI) was registered on 6th May 2011, as a Not-for-Profit Company (NPC) under South African law, but at project preparation, it had not yet started operations and had no staff. The project design included support for operationalizing and running the SADC GMI, which was agreed to be hosted by the University of the Free State in South Africa in consultation with the SADC Member States. SADC-GMI was assigned as the secondary Project Implementing Entity, and the University of Free State would be the Primary Implementing Entity.

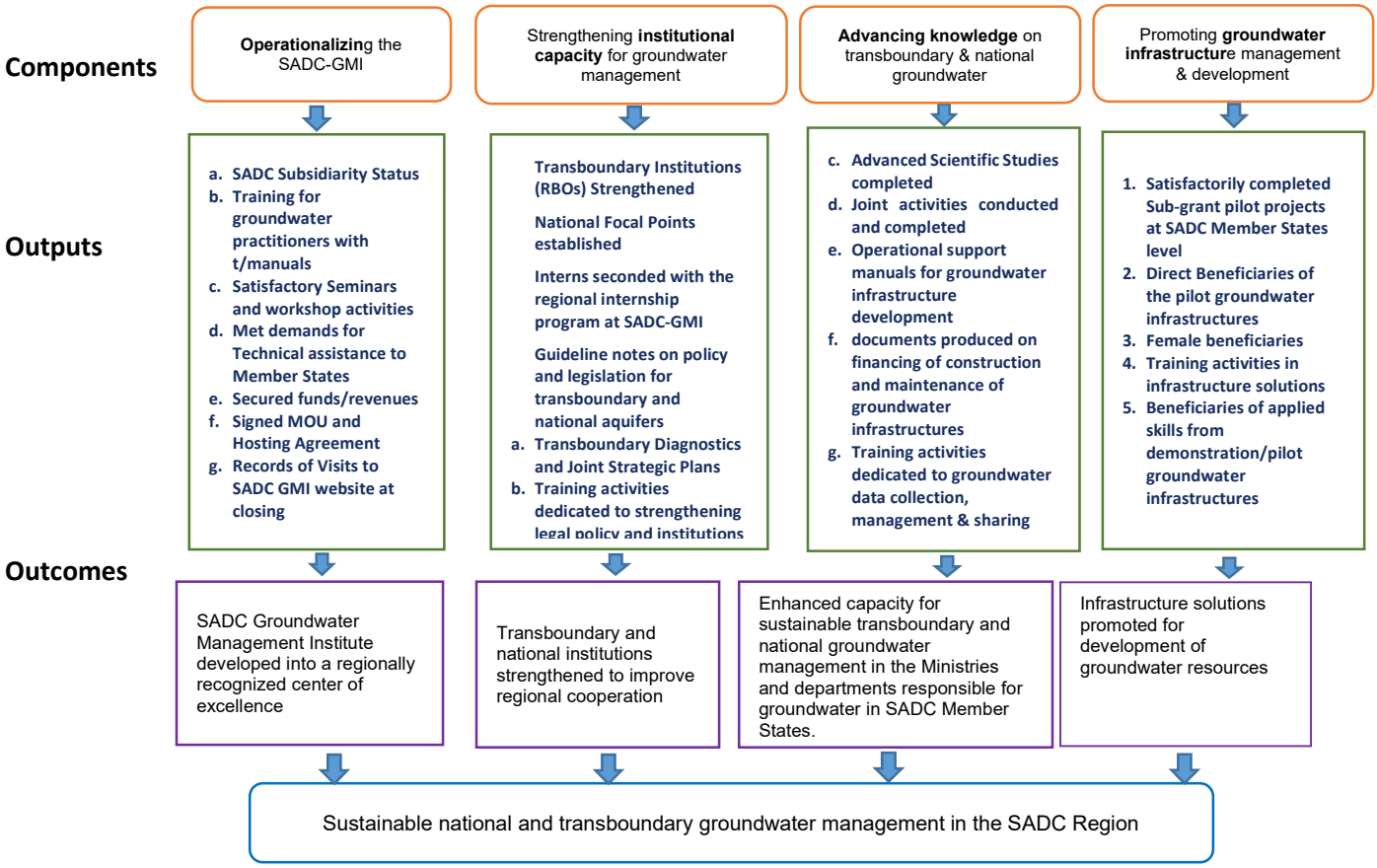
6. **The Project was designed to directly support the Regional Water Policy and Regional Strategic Action Plan for SADC, which aims to foster cooperation on, and mutual benefits from, shared waters among its Member States.** The Regional Water Policy envisaged groundwater, and its strategic conjunctive use with surface water, as playing a key role in building resilience for rural and urban communities. At project design, SADC Member States had developed a Regional Groundwater Management Programme (GMP) within the context of the five-year rolling SADC Regional Strategic Action Plan (SADC RSAP). The project was appraised during the implementation of the SADC RSAP III (2011–2015), [2]which acknowledged the importance of groundwater to the region with a dedicated Groundwater Management Programme of Action (GMP, Program No. 11). This programme elevated sustainable groundwater management in the SADC's development agenda and acknowledged groundwater as a critical resource for the SADC Member States. The Project was also aligned with the 2008 World Bank Regional Integration Assistance Strategy (RIAS) for Sub-Saharan Africa. The RIAS acknowledged that regional approaches to managing shared waters could provide improved water security and more sustainable management of resources than could be achieved by national efforts alone.

[2] SADC Regional Strategic Action Programme Phase III (2011-2015)

7. **The project responded to a request from the SADC Member States to establish and operationalize a regional Center of Excellence on groundwater** to, among other functions, fulfil the critical function of promoting sustainable groundwater management at national and transboundary levels. The project aimed to strengthen institutional and technical capacity, to implement national reforms, to facilitate cooperation on transboundary aquifers thereby mitigating the effects of climate change and pollution, and to develop appropriate response mechanisms to rapidly growing water demand in the SADC region.

Theory of Change (Results Chain)

8. The Implementation Completion and Results Report (ICR) developed the Theory of Change (ToC) based on the Results Framework in the Project Appraisal Document (PAD).



Project Development Objectives (PDOs)

9. The Project Development Objective (PDO) was to support sustainable management of groundwater at national and transboundary levels across SADC Member States.

Key Expected Outcomes and PDO Indicators

10. The project took a regional approach to complement and extend the benefits of individual national interventions, as well as reflecting the important transboundary nature of the aquifers in the region. To support

the sustainable management of groundwater in the SADC region, the PDO would be measured by achieving the following four outcomes:

- ***SADC Groundwater Management Institute developed into a regionally recognized center of excellence.*** This outcome aimed to achieve a fully functioning SADC Groundwater Management Institute (GMI) serving the region as a center of excellence in groundwater-related matters. This included a successful process of SADC-GMI attaining subsidiary status of the SADC Secretariat. With a fully functioning institute in place, the project would strongly impact institutional strengthening, information, and infrastructure aspects of groundwater management among the SADC Member States from local to regional levels. The SADC-GMI would benefit from the regional governance structure needed to oversee project implementation.
- ***Transboundary and national institutions strengthened to improve regional cooperation.*** This outcome aimed to enhance the government's institutional capacity in the SADC Member States and transboundary organizations. This included resources for technical capacity-building within Member States and river basin organizations (RBOs), mobilizing long-term finances for SADC-GMI, and building ownership and engagement at the national level through national focal groups, networks, young professional development and internships, and pilot grants. It also aimed to support the legal, policy, and regulatory frameworks to address gaps in institutional groundwater management tools at national and transboundary levels.
- ***Enhanced capacity for sustainable transboundary and national groundwater management in the Ministries and departments responsible for groundwater in SADC Member States.*** This outcome aimed to improve availability and access to knowledge, scientific research, and data on groundwater. The aim was to provide for a central location for knowledge to be linked to or sourced, as well as the ability to develop new studies on critical groundwater issues. The project promoted the role of infrastructure in developing opportunities for more sustainable groundwater management and for addressing the growing challenges related to drought, recharge, pollution, conjunctive land-water management, water and food security, and climate change at the Member State level.
- ***Infrastructure solutions promoted for development of groundwater resources***. By establishing a system of small sub-grants, the project provided financing to SADC Member States for implementing small-scale, national level activities to demonstrate infrastructure solutions to groundwater challenges. Impact evaluation and learning from groundwater infrastructure investments were undertaken to help monitor the impacts, troubleshoot, and report on results from the investments into improving groundwater infrastructure. Operational support for groundwater infrastructure development was provided by developing and disseminating manuals for infrastructure solutions.

Components

11. **The Project had four components**.

Component A: Operationalizing the SADC Groundwater Management Institute (US$2.00 Million GEF and US$0.8 Million CIWA). This Component covered five key activities: (1) coordination and administration of SADC-GMI, including staffing, enforcing governance, monitoring and evaluation, and progress reporting; (2) raising awareness, knowledge management, and communication involving the critical activities to inform, engage, and maintain dialogue with key stakeholders at all levels; (3) establishing and supporting National Focal Groups using small sub-grants for national partnerships; (4) regional capacity building and training to technical groundwater practitioners, students, and decision makers in SADC Member States from both the public and private sector; and (5) a concerted resource mobilization program was designed and implemented to promote the financial sustainability of SADC-GMI.

Component B: Strengthening institutional capacity for the sustainable management of groundwater in SADC (US$ 1.50 Million GEF). Component B was aimed at addressing gaps in institutional groundwater management tools at national and transboundary levels, including (1) developing the Legal, policy and regulatory frameworks aimed at addressing gaps in institutional groundwater management tools at national and transboundary levels; (2) developing guidelines, standards and management tools to enable groundwater practitioners in the Member States to access and compare up-to-date practical management tools with proven applicability in the region; and (3) strengthening groundwater monitoring and data management systems to support Member States to integrate groundwater monitoring into national level efforts and access guidance on best-practice and affordable monitoring and data management schemes.

Component C: Advancing knowledge on transboundary and national groundwater (US$ 1.80 Million GEF and US$1.20 Million CIWA) was focused on finding solutions to shared groundwater challenges. This included information exchange on findings, training, and implementation of solutions to emergent and priority groundwater management challenges. Support was also rendered for Transboundary Aquifer Management in Member States in collaboration with relevant government authorities and River Basin Organizations (RBOs) for finding solutions to shared groundwater challenges through Transboundary Diagnostic Analysis (TDA) and Strategic Action Plans (SAP), alongside mechanisms for data collection and sharing. Information and Communication Technology for a knowledge-sharing platform were established to build an integrated data management system interlinked with a GIS platform and the project website, involving storing, connecting, and collecting information from various regional and global groundwater initiatives and data sources.

Component D: Promoting groundwater infrastructure management and development (US$ 2.90 Million GEF) was aimed at promoting the role of infrastructure to develop opportunities for more sustainable groundwater management and addressing growing challenges related to drought, recharge, pollution, conjunctive land-water management, water and food security, climate change, among others, in Member States. Member States were supported to engage in partnership development and securing funding for infrastructure development within governments, private sector parties, and/or with bi/multilateral partners and others to allow for scaling up of successful solutions.

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

Revised PDOs and Outcome Targets

12. The PDO did not change throughout the implementation period.

Revised PDO Indicators

13. The PDO Indicators did not change throughout the implementation period.

Revised Components

14. The Components did not change throughout the implementation period.

Other Changes

14. Two Level 2 project restructurings took place, the first in February 2019 and the second in November 2020, as summarized in Table 1.

Table 1: Summary of Two Level 2 Restructuring and Changes Effected

Restructuring	Summary of Changes
February 1, 2019 Level 2	Primarily extending the implementation deadline by 18 months from 30 June 2019 to 31 December 2020. As part of this restructuring, minor reallocations were processed to align each component's budget with identified priorities, especially operationalizing the SADC-GMI. Furthermore, there were adjustments and corrections on some intermediate indicators and targets.
November 24, 2020 Level 2	The project implementation deadline was extended by 6 months from 31 December 2020 to 30 June 2021, due to delays caused by the Covid-19 pandemic

Rationale for Changes and Their Implication on the Original Theory of Change

15. **First Level 2 Restructuring (1 February 2019).** The objective of this restructuring was to ensure the full achievement of the PDO by extending the initial closing date from 30 June 2019 to 31 December 2020. At the time of this restructuring, the activities were well underway but delayed by administrative processes necessary for the formal establishment of the GMI during the first 24 months of implementation. An updated implementation plan was prepared by the SADC-GMI and discussed with SADC and the Bank Task Team. The extension enabled full completion of activities and allowed the SADC to adopt measures that would support the SADC-GMI's sustainability, including launching the Financial Sustainability Plan. Minor re-allocations of costs between categories (Table 2) were processed to align the budget with identified priorities, especially operationalizing the SADC-GMI. Finally, adjustments were made to some intermediate results indicators (IRI) (Table 3), reinforcing, and strengthening the Theory of Change (ToC) but leaving intact the original project design and PDO.

Table 2: Revised Component Costs

Component name	Initial Cost (US$M)	Feb 2019 Revised (US$M)
A: Operationalization of the SADC Groundwater Management Institute	2.80	3.70
B: Strengthening institutional frameworks for sustainable groundwater management	1.50	1.60
C: Advancing knowledge & information-sharing on transboundary and national groundwater	3.00	1.90
D: Promoting groundwater infrastructure development	2.90	3.00
Total	**10.2**	**10.2**

Table 3: Revised Intermediate Outcomes and Rationale

Component	Intermediate Result Indicator	Changes made at restructuring and Rationale
D	Running of a fully integrated data management system: stores, connects, collects and makes available information from groundwater initiatives and data sources	**Deleted**: This indicator was dropped because it was already reflected in the Manuals.
B	# of guideline notes on policy and legislation for transboundary and	**Reworded:** to harmonize it with the scope of activities of SADC- GMI. The number of policy notes was reduced from 20 to 10

	national aquifers developed and disseminated	
A	Strengthened transboundary institutions with improved analytic tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management (Number)	**Revised:** Activity focused on River Basin Organizations, the five (5) participating ZAMCOM, ORASECOM, LIMCOM, OKACOM and CUVECOM

16. **Second Level 2 Restructuring (24 November 2020).** An October 2020 Implementation Support Mission established that—although disbursement was high at 98% as of 30 September 2020—the pace of project implementation had been delayed by the COVID-19 pandemic. The SADC-GMI had developed a COVID-19 mitigation plan that had been implemented since March 2020. However, the pace of works associated with the small grant pilot projects had suffered considerably due to travel restrictions in several SADC Member States. As a result of these delays, the mission assessed that a six-month no-cost extension of the project closing date was justified, extending the project from 31 December 2020 to 30 June 2021, as requested by the SADC Secretariat (in a letter dated 15 September 2020). The no-cost extension was approved by the Bank on 24 November 2020, enabling the project to complete its activities and achieve its PDO.

17. **The restructuring and changes in the results framework do not justify applying a split rating.** The PDO was not revised, and the scope of the project remained the same. None of the four components or sub-components was dropped or substantially revised. The first Level 2 restructuring (January 2019) did update the project's Results Framework to improve the assessment of the PDOs—taking into consideration issues identified with the original indicators—but it did not imply narrowing the project's scope or ambition.

II OUTCOME

A. RELEVANCE OF PDOs

Assessment of Relevance of PDOs and Rating

18. **The Rating on PDO Relevance is Substantial.** The PDO—*to support sustainable management of groundwater at national and transboundary levels across SADC Member States*—remains highly relevant to the SADC region's strong need to improve management of its scarce water resources (including through capacity building) and enhance climate resilience of Member States. The SADC Water Sector program of work is outlined in the five-year Regional Strategic Action Plans (RSAPs) on Integrated Water Resources Development and Management to implement the Regional Water Policy (RWP). The PDO was closely aligned with both the RSAP Phase III (2011-2015) and later RSAP Phase IV (2016-2020). RSAP III included programs that elevated sustainable groundwater management in the SADC's development agenda as a critical future resource, with a focus on four strategic pillars: (1) policy and institutional framework, (2) transboundary aquifer management, (3) information and awareness-raising, and (4) and deepening regional cooperation. RSAP IV featured a dedicated sub-program on groundwater development and management, considering that the effects of climate variability on surface water leave groundwater as a crucial source of water. The project objective focused on the GEF International Waters Focal Area on the global management of transboundary water resources, which recognizes the important role of building on initial assessment of threats and opportunities through Transboundary Diagnostic Analyses (TDAs), and regionally

agreed Strategic Action Programs (SAPs) is directly in line with the GEF 7's strategic approach.

B. ACHIEVEMENT OF PDOs (EFFICACY)

Assessment of Achievement of Each Objective/Outcome

The project achieved all the expected outcomes and exceeded some. Details on the achievements are detailed in Annex 1 (Results framework and outputs).

19. **Outcome 1:** ***SADC Groundwater Management Institute (SADC-GMI) developed into a regionally recognized center of excellence.*** Based on the PAD, this role entails fulfilling an 'interlocutor' role towards the SADC Secretariat as the SADC entity through which SADC implements its regional groundwater strategy and facilitating the meetings of the SADC Subcommittee on Hydrogeology, developing a research programme, managing and disseminating knowledge, raising awareness and importantly, communicating to inform, engage and maintain dialogue with key stakeholders in SADC region at all levels. In the few years since its operationalization, SADC-GMI has achieved successes in each of these fields, albeit in varying degrees. It has gained visibility and recognition for its capacity to bring groundwater to the attention of decision makers in the SADC region, to provide guidance and leadership to the implementation of SADC's Regional Strategic Action Plan on groundwater and to promote regional collaboration in the field of groundwater management and development. The SADC-GMI has also successfully partnered with a wide range of stakeholders to leverage resources and realize its mandate.

20. The SADC-GMI has effectively played its role as interlocutor and regional integration contributor in managing groundwater and has satisfactorily fulfilled 94% of requests from Member States and stakeholders on groundwater. The project facilitated direct linkages between SADC-GMI and SADC member states through sharing best management practices and tailoring solutions to the local conditions. By developing the SADC Groundwater Information Portal (SADC-GIP) and the SADC Grey Literature Archive (SADC-GLA), the project supported developing a framework for regional groundwater data collection and sharing, but also recognized beyond the regional boundaries. SADC-GMI has managed to become a trusted partner recognized by prime international institutions in the field of groundwater for its capacity to raise the profile of groundwater and facilitate knowledge to the level of decision-makers in the SADC Region.

21. **Outcome 2:** ***Transboundary and national institutions strengthened to improve regional cooperation.*** The project achieved institutional strengthening at the national and transboundary levels through a range of activities. From a total of 16 member states, the project established National Focal Groups in 5 countries - Eswatini, Malawi, Mozambique, Namibia, and Zimbabwe. The establishment of multi-stakeholder National Focal Groups (NFGs) strengthened and formalized in-country dialogue on groundwater development opportunities and challenges. It also had a cascading effect in strengthening the capacity of those institutions that volunteered their participation in the NFGs and institutions such as NGOs, Associations, and Development Partners working in-country also benefit from this activity. The establishment of NFGs in the remaining member states is expected to be picked up and completed in the next phase of the project. Through the young professionals' internship program as well as regional and national training events on a wide variety of topics, the technical and management skills of participants from respective Member State government ministries, departments, and agencies were enhanced, culminating in stronger institutions. Sixty-five young professionals benefited from the capacity building program through training and internships, of which 23 (about 1/3) were female. National water utilities, drilling companies, consulting firms, academia, and research institutions across the region were reached through institutional strengthening endeavors. At the transboundary level, the project particularly targeted strengthening the capacity of the six active RBOs in the SADC region: (1) Cuvelai Commission (CUVECOM), (2) Limpopo Commission (LIMCOM), (3) Okavango Commission (OKACOM), (4) Orange-Senqu Commission (ORASECOM), and (5) Zambezi Commission (ZAMCOM), as

well as to a lesser extent, (6) the Buzi-Pungwe-Save (BUPUSA) secretariat. The institutional strengthening focused on enhancing internal management capacity and skills for groundwater management through operationalizing Groundwater Committees, developing knowledge products and strategies on the status of groundwater in the RBO areas, and technical assistance to boost internal capacity to deliver on their mandates.

22. **Outcome 3:** ***Enhanced capacity for sustainable transboundary and national groundwater management in the Ministries and departments responsible for groundwater in SADC Member States.*** The SADC- GMI carried out a gap analysis exercise to determine the current state of groundwater management at both national and transboundary levels, from policy, legislative, and institutional perspectives, as well as identifying key opportunities and challenges through the project. SADC-GMI has developed the Groundwater Policy, Legal and Institutional (PLI) Gap Analysis and Action Plans both at the SADC regional level and individually for each of the 16 SADC Member States. The PLI review provided a diagnostic of the groundwater sector, including a long-term view and a program of activities structured around three main components: capacity, knowledge and building resilient livelihoods to be implemented in the next phase of the project. SADC-GMI conducted a capacity needs assessment for groundwater management in the Member States to assess the priorities for capacity strengthening to ensure that interventions are Member States demand-driven.

23. The project collaborated with other regional and international organizations and programs culminating in the mutual strengthening of institutional capacity for groundwater management and development in the SADC region. The project collaborated with UNESCO-IHP to implement the Governance of Groundwater Resources in Transboundary Aquifers (GGRETA) phase I and phase II projects that were implemented in the SADC region focused on the Stampriet Transboundary Aquifer System. SADC-GMI also collaborated with UNESCO-IHP to design the GGRETA III project currently under implementation. Through the GEF support, SADC-GMI attained membership from the International Association of Hydrogeologists (IAH). Since 2017, SADC-GMI has also been collaborating with the UN-affiliated International Groundwater Resources Assessment Centre (IGRAC) to develop and operationalize the SADC Groundwater Information Portal as well as the SADC Groundwater Literature Archive. The latter was also in collaboration with the British Geological Surveys of the United Kingdom. The project provided training to numerous stakeholders in the groundwater management field on guidelines for groundwater data collection, management and sharing as well as on the enabling policy, legal, regulatory, and institutional environments for effective groundwater management.

24. ***Outcome 4: Infrastructure solutions promoted for the development of groundwater resources***. The project developed a Sub-Grants Manual to facilitate the development of demonstration projects by Member States (a summary of the thirteen (13) national projects is detailed in annex 4). The small-grants infrastructure projects were aimed to promote innovative solutions in groundwater development. Some proposals submitted by MSs may have been motivated by direct development needs, but the design of the Small-Grants scheme allowed SADC-GMI's, in its responsibility to evaluate all proposals on their technical and innovative merits, to engage in a dialogue with the respective MSs and strengthen the quality and innovative aspects of proposals. As an example, the proposal for a community-led groundwater-based village water supply scheme in south Malawi evolved through the introduction of innovative exploration methods into a demonstration project for the feasibility of climate-resilient village water supply schemes using deep groundwater resources. While all sixteen SADC member states were targeted for implementing sub-grant pilot projects, only ten countries finally participated, with one sub-grant in Malawi, three in Botswana, three in Zimbabwe, one in Tanzania, one in Mozambique, one in Zambia, one in Namibia, one in Eswatini, and one in Lesotho. A sub-grant project in Angola was stopped at 60% completion due to challenges with absorption capacity, especially on procurement, though this activity is expected to be picked up and completed during the next phase of the project. Sub-grant projects in the other six Member States—Madagascar, Seychelles, Democratic Republic of Congo, South Africa and Comoros—were not implemented for various reasons, mainly due to challenges in selecting eligible interventions and preparing proposals.

Table 4: PDO Indicators Targets and Achievements

PDO Results Indicators	Target	Achievement
PDO Indicator One: Development of the SADC Groundwater Management Institute to a recognized center of excellence	Expectations on GMI met with 80% satisfaction	94% fulfilled satisfactorily
PDO Indicator Two: Transboundary institution strengthened to improve regional cooperation	Operating with full staff, work-program & long-term Financial Management Plan implemented.	SADC-GMI operating at full capacity, Financial Plan implemented, and 5 River Basin Organizations strengthened
PDO Indicator Three: [3] Enhanced capacity for sustainable transboundary groundwater management in the Ministries responsible for groundwater in SADC Member States	70% of capacity demands met	83% of capacity demands met
PDO Indicator Four: Promoting infrastructure solutions for the development of groundwater resources Direct Project Beneficiaries Percentage of Female beneficiaries	 5,000 40%	 96, 280 53%

Justification of Overall Efficacy Rating

25. Efficacy is rated as Substantial. This rating is based on a best judgment assessment of the project's achievements in meeting the core PDO-level objectives. The project almost fully delivered the expected outcomes, as reflected in the progress on intermediate indicators used to assess the success of the project. The project leaves SADC-GMI as an effective center of excellence in groundwater with the tools required to promote cooperation and management of groundwater resources. The operation had targeted to implement 15 subgrant projects but only completed 13 (while one was stopped at 60% completion).

C. EFFICIENCY

Assessment of Efficiency and Rating

Rating is: Modest

26. **Economic Analysis.** The value of groundwater is challenging to assess accurately in terms of its ability to contribute to income generation and poverty reduction, including for women and other vulnerable groups. While groundwater underpins the livelihoods and wellbeing of vast amounts of people in Eastern and Southern Africa, provides water for livestock, and enables ecosystem services and tourism, its contribution to such uses is more difficult to value compared to its use as a critical production input, for example, as an input into mining or to commercial agriculture.

[3] Through a successful implementation of knowledge initiatives, infrastructure pilot projects and targeted capacity building activities for staff from Ministries, the project raised the capacity of the Member States. Participants completed questionnaires at the end of each training event whose results were used to populate this indicator.

27. The project was mainly focused on technical assistance, research, strengthening institutional, legal, and policy frameworks for improved groundwater management at national, transboundary, and regional levels, advancing research on and sharing knowledge of priority groundwater challenges facing SADC Member States and the region. As part of a Groundwater Valuation Study conducted in 2011, a detailed assessment of the socio-economic value of groundwater in SADC was made through case studies on four aquifers in Namibia, South Africa, Botswana and Tanzania using a combined methodology for economic valuation. The study found that groundwater provides significant economic cross-sector contributions. For example, the Usangu Alluvial Aquifer in south-central Tanzania has a combined present value of $734,963,416 (16 percent discount rate over 25 years) with contributions to irrigation, regulation for groundwater-dependent ecosystems such as wetlands, hydropower and tourism.

28. Component D provided support through sub-grants to SADC Member States to develop infrastructure solutions to enhance groundwater management for human and productive use. Many additional benefits from this project are not easily quantifiable. Infrastructure promotion such as sand dams, managed aquifer recharge structures or innovative rural water supply schemes had a direct beneficial impact on all people and economic activities if barriers to access for women and other vulnerable populations are adequately addressed. The sub-grant projects were at the core of effecting change in groundwater management in SADC Member States, impacting socio-economic conditions, access to water, and equitable distribution of groundwater resources. The sub-grant projects provided more than 20,000 people with access to potable water as well as irrigation for four community vegetable gardens to support food security for the poor.

29. **Administrative efficiency.** The project was delayed by about 24 months at the start, which impacted project efficiency. At the start of the project, the subsidiarity status of SADC-GMI to SADC was anticipated to have been approved earlier to benefit the project from the regional governance structure necessary to oversee the implementation. The subsidiarity status was only obtained in August 2020, though the SADC Water Division still provided support through technical guidance as well as serving as the Chairperson of the SADC-GMI Board of Directors. **T**he project disbursed all its available funds.

D. JUSTIFICATION OF OVERALL OUTCOME RATING

Rating is: Satisfactory

Based on the above assessment, with relevance rated “Substantial”, efficacy rated “Substantial”, and efficiency rated “Modest”, the overall outcome rating of the project is “Satisfactory”.

E. OTHER OUTCOMES AND IMPACTS (IF ANY)

Gender

30. The project demonstrated a general awareness of a gender-focused approach to project development and implementation. Whilst acknowledging the relatively low number of females in middle and higher-level management positions in the water sector in general, the project adopted deliberate strategies to engage, involve, and benefit women, including: (i) Dedicated training delivered in collaboration with UNESCO-IHP on “International Water Law and Gender”; (ii) a policy was put in place to encourage Member States and other stakeholders to nominate women to participate in training events offered by SADC-GMI, culminating in an estimated 40% of beneficiaries in this category being women; (iii) the young professionals internship program implemented through the project also deliberately targeted serving women, resulting in one quarter of the internships being for women; (iv) the sub-grant manual—used to guide the implementation of pilot infrastructure projects in the Member

States—made it mandatory to target female beneficiaries, resulting in about 53% of the direct beneficiaries being female; and (v) in recognition of its shortcomings in mainstreaming gender and other social issues in groundwater development and management, the SADC-GMI recently finalized a Gender Equality and Social Inclusion (GESI) Mainstreaming Strategy.

Institutional Strengthening

31. **As discussed in the above sections, the project had a strong institutional strengthening element with the aim of building the capacity of the regional, transboundary, and member states institutions.** The c SADC Secretariat's Water Division's capacity for groundwater development and management was significantly increased through the project's implementation. From the SADC Secretariat, the capacity propagated to all the region's ministries and departments responsible for groundwater through the respective regional governance structures, including the sub-committee on Hydrogeology, the Water Resources Technical Committee, and the Ministers of Water. The project strengthened institutions by improving policy and legislative frameworks whilst promoting scientific research, knowledge, and information exchange. The project also established strong partnerships, which were then formalized for sound groundwater management in the region.

Mobilizing Private Sector Financing

32. The project did not include any elements anticipated to mobilize private sector financing.

Poverty Reduction and Shared Prosperity

33. The project undertook Policy, Legal and Institutional (PLI) gap analyses and developed action plans and some roadmaps at the national and SADC level to influence their alignment towards sustainable and equitable access by the more than 70% of the SADC region's rural inhabitants who depend on groundwater for their livelihoods and other human settlement activities.

34. Community level pilot projects were implemented in some Member States to benefit the livelihoods of the poor directly. The pilot projects at Chimbiya village in Malawi and Mochocolate Village in Mozambique benefited more than 20,000 people to access potable water. Four groundwater supply pilot projects implemented at Tsetsebjwe and Gobajango in Botswana as well as at Whunga and Dite in Zimbabwe were for community vegetable gardens to support food security for the poor.

Other Unintended Outcomes and Impacts

35. The project has successfully leveraged on strong partnerships and initiatives to complement the activities to expand the focus also on the biodiversity and Groundwater Dependent Ecosystems. The regional approach of the project has further helped broaden the interconnectedness of the water sector management aspects in the SADC region while bringing together like-minded professionals to engage in developing solutions for groundwater management for the region.

III KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

36. Lessons learned informed the design of the project. The project was informed by lessons learned from the previous SADC Groundwater and Drought Management Project. Based on the lessons learned, SADC Member States were committed to endorsing the SADC Secretariat mandate to support national governments and transboundary cooperation on the management of groundwater resources**.** According to the PAD, on the basis of

the lessons learned the project needed to enable the operationalization of SADC- Groundwater Management Institute (GMI) under the hosting arrangements with the University of Free State in South Africa as agreed by the Member States. The communication and awareness-raising on groundwater management issues were initiated in the predecessor operation and carried forward by the project.

37. **While the project design was technically sound, its implementation readiness could have been stronger.** Delays during the first 24 months were due to (i) administrative delays with establishing the Groundwater Management Institute (SADC-GMI) and (ii) limited implementation capacity within the SADC-Secretariat and University of Free State (UFS). The time lost could not be recovered even though implementation picked up significantly, with strong performance by the SADC-GMI's management. For a significant period, many partners in the UFS and SADC-GMI struggled to cope with the complicated systems that would enable the SADC-GMI to operate effectively both as a South African registered NPC and as a project implementing unit. The delayed project start culminated in a serious lag in achieving project milestones, also delaying project completion from the original date of 30 June 2019 to the actual closing date of 31 December 2020.

B. KEY FACTORS DURING IMPLEMENTATION

38. **Adequate supervision of the project.** During the implementation period, there were three task team leaders (TTLs), and the transition between each seems to have been smooth. The Aide Memoires indicate that task teams proactively identified opportunities to scale up project activities for development impact, engaged in appropriate follow-up and resolution of bottlenecks, and appropriately adapted to changing conditions. The delays and lack of progress during the initial months of implementation were documented but inadequately reflected in the project ISR ratings.

39. **COVID-19 Pandemic slowed down implementation.** The project was smoothly heading to a successful closure in December 2020 (a revised closing date from first Level 2 Restructuring), when implementation was slowed by the COVID-19 pandemic beginning in March 2020, especially for those activities that required physical interaction. The sub-Grant infrastructure projects in the Member States were most affected since all SADC Member States imposed lockdowns and travel restrictions that stopped small works projects for a period of about eight months. This scenario resulted in recommendations, following the Implementation Support Mission of October-November 2020—of a second no-cost extension, extending the project end date by a further six months to 30 June 2021.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

40. **The results framework for the Project was well aligned with the activities and components, contributing to the PDO objectives.** The key outcome indicators also reflected the PDO aspects well. As indicated in the PAD, the Director of the SADC-GMI was responsible for the project's overall monitoring and evaluation (M&E), supported by project staff managing reporting and communication responsibilities. The M&E reporting requirements were incorporated into the Project Implementation Manual and into quarterly Progress Reports to the Bank (reporting on results indicators was to be done twice a year, parallel to implementation support from the Bank's team). Project result indicators and associated targets for each component were specified with proper data collection and reporting methodology**.** A Mid-Term Review was planned to be held approximately 2.5 years after project effectiveness but was never done.

M&E Implementation

41. The M&E Specialist was on board with overall responsibility for collecting data and issuing M&E reports. The SADC-GMI prepared periodic monthly reports; however, the reports mostly focused on contract details, inputs, activities, and outputs with very limited reflection and evaluation.

M&E Utilization

42. The M&E Reports were used by the Bank team to monitor progress. Despite initial administrative issues that caused severe delays, the SADC-GMI and the Bank remained focused on achieving the results set out in the project's M&E framework. Implementation support missions began and ended with a review of and discussion on each of the project indicators. These discussions centered on the underlying implementation bottlenecks affecting the achievement of results. Findings and recommendations from implementation support missions were used to help the project team channel more efforts and resources where needed to ensure the project's successful implementation. The Bank's Implementation Status and Results (ISR) Reports assessed ratings for Development Objective and Implementation Progress, as well as other associated ratings, based on mission discussions and progress in meeting the indicators. The Bank Aide Memoires also utilized the M&E framework to inform implementation and decision making.

Justification of Overall Rating of Quality of M&E

Rating: Substantial

43. From design to implementation and utilization of M&E outcomes as part of the management process, the M&E part of the project is appropriate. The M&E was useful during implementation as it prompted management for corrective action at an early stage. Overall, the M&E design and implementation allowed for adequate assessment of the main outcomes of the project.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

Environment and Social Safeguards

44. **At Appraisal, the project was classified as Environmental Category B, and the Risk rating was low.** Safeguard policies triggered by the Project were: OP/BP4.01 Environmental Assessment, OP/BP 4.11 Physical Cultural Heritage, OP/BP 4.12 Involuntary Resettlement, and OP/BP 7.50 Projects in International Waterways. As part of project preparation, an Environmental Management Framework (EMF) with an Environmental Management Plan (EMP) and a Resettlement Policy Framework (RPF) were developed, disclosed, and consulted in line with due diligence requirements for OP/BP 4.01, 4.11 and 4.12. The EMF-EMP/RPF provided a framework that Member States and project implementing agencies could adapt to local circumstances and

downstream investments (OP/BP7.50). Projects on International Waterways was triggered because of the investments in diagnostics of select transboundary aquifers within the SADC region.

45. **The project dedicated resources to promoting infrastructure solutions to improve groundwater management through demonstration projects.** The types of infrastructure solutions included borehole drilling and exploration practices, groundwater monitoring stations, operation and management of groundwater wells, aquifer monitoring stations with no significant or irreversible environmental impacts. The project did not have project-affected persons. The Borrower prepared a simplified Environmental Management Plan containing adequate provisions to guide the project management unit on preparing site-specific EMPs. The SADC-GMI did not provide for a dedicated environmental and social specialist, and the services of an environmental consulting firm were procured to monitor and report on implementing the EMPs in all SADC Member States. The project remained fully compliant with safeguards policies, consistently rated as "Satisfactory" in ISRs.

46. **All relevant safeguards instruments were prepared, cleared, and disclosed in-country and by the Bank.** Environment and social safeguards requirements were incorporated in a sub-grant manual, as were agreements to ensure compliance at the sub-grantee level. Relevant safeguards instruments were prepared for each sub-grantee project and submitted for review and clearance by the appointed E&S consultant responsible for ensuring compliance with both the SADC-GMI project sub-grantee manual and the World Bank Safeguards requirements. As part of the project close-out, each sub-grantee submitted an environmental and social close-out report, with supporting evidence, to the SADC-GMI for evaluation. Due to COVID-related travel restrictions, the consultant could not complete site verification audits and relied on the project close-out reports and supporting evidence to compile a final safeguards compliance audit report submitted to the Bank as part of the project close-out requirements. The SADC-GMI's capacity on environmental and social safeguards was steadily improved throughout implementation, with support from the World Bank.

47. **The SADC-GMI did not have a project-wide grievance redress mechanism (GRM) given the nature of the Project activities.** Each sub-grantee had a GRM in place for the sub-projects and reported to SADC-GMI through the E&S consultant. There was a standard approach developed by the consultant and adjusted to each specific project area. The project recorded two grievances—one in Zimbabwe and one in Botswana. Based on these grievances, the site-specific designs were adjusted. The grievances were closed out following the approval of the respective communities.

Financial Management

48. Responsibility for financial management and procurement activities for the project was with the UFS and carried out through the UFS' support staff. The funds were channeled directly to the UFS to bring efficiencies in project implementation, facilitate reporting, and foster clarity on accountability and governance. The project produced acceptable quarterly interim financial reports and annual financial statements. Financial management supervision was also carried out by the Bank on a timely basis, overall sustaining regular reviews of interim financial and audit reports, all of which were unqualified. Payments were made through transactions from the designated account directly to the providers of goods, works, and services, upon submitted statements of expenditures by the implementing agencies. FM performance was consistently rated Satisfactory in Bank ISRs.

Procurement

49. The procurement plan for the project was prepared and reviewed at Appraisal. As mentioned in other sections, the project experienced significant delays at the start, partly due to delays in hiring staff within the SADC-GMI. The ISR rating for procurement was downgraded to Moderately unsatisfactory in June and December 2016. The Bank recommended that the SADC-GMI advance recruitment of staff compliment and put in place the required management systems, with fiduciary support by UFS while devolving its functions from implementation to fiduciary oversight. The procurement rating was upgraded from MU to MS in December 2017 when a Procurement Specialist was appointed, and the Sub-Grant Manual was developed. The rating remained MS until June 2020, when the team upgraded ISR rating to Satisfactory because the SADC-GMI had considerably improved in concluding procurement packages and proactively negotiated contracts to overcome COVID-19 challenges.

C. BANK PERFORMANCE

Quality at Entry

50. Implementation arrangements. Member States agreed on a hosting arrangement of the SADC-GMI by the Institute of Groundwater Studies (IGS) within the UFS in South Africa. IGS was identified through a competitive procurement process. This was considered, at the time, the optimal decision given that the SADC-GMI only existed on paper, having no staff in place. Though the project's effectiveness date was 30 June 2015, actual implementation did not properly take off until August 2016 mainly due to a) the complexity of setting up the institute as a subsidiary of the SADC and b) a hosting agreement with the UUFS in South Africa. The Bank task team remained responsive and had regular consultations with the SADC-GMI, UFS and the SADC Secretariat to unlock the bottlenecks and make the required changes. Notwithstanding this slow start, remarkable progress was made in the last four years of implementation (from 2017 to 2021). At project closure**,** the SADC-GMI had acquired the human and technical capacity to effectively implement the envisioned activities as a regional center of excellence on groundwater.

Quality of Supervision

51. In addition to the formal implementation support missions twice a year, there were frequent technical discussions, and the task team provided just-in-time support, helped to solve problems, visited project sites, implemented trainings, and participated in consultations. One of the great advantages was that the Bank task team was based in the region and available to provide timely support. There was also a good skill-mix within the Bank task team both on hydrogeology and institutional aspects. ISRs and Aide Memoires were thorough and proactive in identifying weaknesses and presenting recommendations to address them. Project documents raised key implementation issues, proposed remedies, set out timebound actions, and were generally of good quality. These factors led to an acceleration of progress in implementation and correction for initial delays.

Justification of Overall Rating of Bank Performance

52. The overall World Bank performance is rated Satisfactory. Generally, the World Bank team considered lessons learned and the reality on the ground during project implementation and took proactive corrective measures to ensure quality. The intensive support provided by the Bank helped the SADC-GMI make a good turnaround and display results.

D. RISK TO DEVELOPMENT OUTCOME

53. The risk to the project's development outcome is Moderate. In terms of institutional sustainability, the project imparted a strong institutional strengthening element at the regional, transboundary, and member state levels for groundwater management and sustainable use. The SADC-GMI's solid foundations and mandate, as drawn from the SADC water sector program and strategic intent, are clearly outlined. The organization has successfully moved from an "establishment phase" and is now fully operational with key structures in place and a Strategic Business Plan (2018/2023). As part of the Strategic Business Plan, a risk assessment with a mitigation action plan should guide the organization regarding potential pitfalls and ways to manage these. There is, however, a risk stemming from financial sustainability. Though the SADC-GMI has developed a robust Financial Sustainability Plan (FSP) with a number of fundraising mechanisms, systems, and procedures, accomplishing this will require some time to realize. The Sustainable Groundwater Management for SADC Member States Phase 2 (2021-2026) will continue to provide support to operationalize the Financial Sustainability Plan.

V. LESSONS AND RECOMMENDATIONS

54. **Project Design.** The implementation of sub-grantee pilot projects offered significant lessons that could assist in implementing and scaling up. While the SADC and the Member states demonstrated strong ownership and commitment in all project cycle stages, heterogenous legislation and technical specifications in country-specific regulations made it very difficult to issue a cohesive call for water infrastructure project proposals across Member States. In addition, the sophisticated technical equipment required for groundwater management and development is not always readily available in some Member States, requiring long procurement lead times and vulnerability to foreign exchange rates. More flexibility in adapting infrastructure programs to evolving conditions on the ground would be beneficial.

55. **Complex implementation of Transboundary Aquifer (TBA) initiatives.** Linking transboundary and conjunctive use planning is complex, requiring technical and institutional cooperation. Integrated transboundary planning is still currently based primarily on hydrological boundaries, though consideration of groundwater is becoming more common. Transboundary River Basin Organizations (RBOs) provide a useful platform for institutionalizing and sustaining cooperation. Groundwater requires more attention in RBOs. The project has introduced tools to incorporate groundwater in the work program of five RBOs, and lessons from the exercise can be adapted and upscaled across the region. Developing and implementing monitoring systems early in transboundary projects may also be necessary, and further engagement of the SADC-GMI with relevant institutions through established formal engagement can help facilitate this. The SADC-GMI has also contributed insights and knowledge to other TBAs in the region and continues to actively pursue opportunities for partnerships with several national, regional, and international organizations in order to undertake more research to understand transboundary aquifers in the region better and to establish their groundwater potential.

56. **Proactivity.** The project demonstrated the importance of consistent, proactive measures in project implementation. The World Bank's team corrective action during the restructuring processing and the continuous supervision support that helped correct technical issues at the site level hugely helped change the uncertain situation at the start of the project to a good outcome by closure. The proactive efforts by SADC-GMI were efficient in developing and implementing contingency plans in response to the COVID-19 crisis.

57. **Building and sustaining institutional capacity.** As a condition of its establishment as a subsidiary of the SADC, it was agreed that the SADC-GMI would not be financed through fees from the Member States, and it will have to build its own financial basis for the long term. During project implementation, the SADC-GMI successfully raised some income from project management fees and training events and conferences, though more than 80% of its costs were covered through grants. A goal for next steps is to develop mechanisms to develop a strong and financially sustainable institutional set-up to help develop groundwater resources strategically in Southern Africa.

ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

II. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: Development of the SADC Groundwater Management Institute to be a recognized center of excellence

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Development of the SADC Groundwater Management Institute to a recognised center of excellence	Text	n/a 01-Jul-2014	Expect:s on GMI met with 80% satisfaction 30-Jun-2019	GMI established with 80% satisfaction 30-Jan-2019	92.6% of the requests from Member States and stakeholders fulfilled satisfactorily 30-Jun-2021

Comments (achievements against targets):

The successful implementation of numerous studies and capacity building activities under the 4 project components has given SADC-GMI visibility and recognition as a regional center of excellence. Furthermore, the SADC-GMI has partnered with a wide range of stakeholders to leverage on their resources to realize its mandate in groundwater management and development in the SADC region built on four pillars:

Data management: Through the development of the SADC Groundwater Information Portal (SADC-GIP) and SADC Grey Literature Archive (SADC-GLA), SADC-GMI has established a central point for storing and linkages to groundwater data for the region and developed a framework for data collection across the region.

Capacity building: sixty-five (65) young professionals were engaged through training and internships programmes in different areas on groundwater management and expertise. In addition, members states benefited through capacity building of National Focal Groups and different structures within the member states. Specific activities were targeted towards the River Basin Organizations through signing of MOUs (5-RBO), establishment of groundwater committees and specific training programmes.

Advancing knowledge and Research: Studies on specific technical and policy issues were conducted to identify gaps and derive solutions in the all 16 member states and at transboundary River Basin level.

Awareness raising and information dissemination: SADC-GMI launched a website (www.sadc-gmi.org) where all activities were shared and publicized. The SADC Groundwater Information Portal (www.gip.sadc-gmi.org) that also hosts the SADC Hydrogeological Map and Atlas are online. Through hosting annual the SADC regional conferences on groundwater management, SADC-GMI has created a platform for stakeholders to share experiences.

Objective/Outcome: Transboundary institutions strengthened to improve regional cooperation

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Transboundary institutions strengthened to improve regional cooperation	Text	Establ. 01-Jul-2014	Operating with full staff, workprgrm & long-term Financial Management Plan implemented 30-Jun-2019	Operating with full staff, work-prgrm & long-term Financial Management Plan impl 30-Jan-2019	SADC-GMI operating @ full capacity & 5 RBOs strengthened 30-Jun-2021

Comments (achievements against targets):
At transboundary level, SADC-GMI signed Memoranda of Understanding (MOUs) with five (5) River Basin Organizations (LIMCOM, ZAMCOM, ORASECOM and OKACOM and CUVECOM). Engagement with the RBOs include Groundwater Technical Committees and rendering of Technical assistance on

Transboundary aquifers, training and capacity building. Prior to project closure, to a lesser extent SADC-GMI had started engagements with the sixth RBO, Buzi-Pungwe-Save (BUPUSA). Out of the 30 known TBAs in the SADC region, implementation of activities is ongoing in 5 (i.e. Stampriet, Ramotswa, Tuli-Karoo, Shire and Eastern Kalahari).

Objective/Outcome: Enhanced capacity for sustainable transboundary groundwater management

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Enhanced capacity for sustainable transboundary groundwater management in the Ministries responsible for groundwater in SADC MemberStates	Text	n/a 01-Jul-2014	70 % of capacity demand met 30-Jun-2019	70% of capacity demand met 30-Jan-2019	81% of capacity needs met 30-Jun-2021

Comments (achievements against targets):
Through the successful implementation of numerous knowledge initiatives and infrastructure pilot projects, SADC-GMI raised the capacity in the Water Ministries of the Member States. A range of targeted capacity building activities for staff from Ministries further enhanced their institutional capacity.

Objective/Outcome: Promoting infrastructure solutions for the development of groundwater resources

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct project beneficiaries	Number	0.00	5000.00		96,280.00

		01-Jul-2014	30-Jun-2019		30-Jun-2021
Female beneficiaries	Percentage	0.00	40.00	53.00	53.00

Comments (achievements against targets):

A.2 Intermediate Results Indicators

Component: D: Promoting groundwater infrastructure development

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Running of a fully integrated data management system: stores, connects, collects & makes available information from groundwater initiatives and data sources	Yes/No	No 01-Jul-2014	Y 30-Jun-2019	No 30-Jan-2019	No 30-Jun-2021

Comments (achievements against targets):
The Indicator was deleted/dropped at restructuring (January 2019). System enhancement to generate real-time information has been targeted for the future project phase

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
# of documents produced on financing of construction and maintenance of groundwater infrastructures	Number	0.00 01-Jul-2014	5.00 30-Jun-2019		5.00 30-Jun-2021

Comments (achievements against targets):
Guidelines produced: 1. O&M Manual for GW Infrastructure 2. Guideline on Preparation of ESS Close-out Reports 3. SADC-GMI ESS Reporting Protocols for Small Grant Infrastructure Projects 4. Simplified ESMP template 5. Training Manual & Guidelines for Preparation of GW project proposals

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Sub Grant Manual Implemented	Text	None 01-Jul-2014	Updated & Implemented 30-Jun-2019		Sub-Grant Manual has been in use since Dec 2017 and has been reviewed 30-Jun-2021

Comments (achievements against targets):
Manual was reviewed and updated in 2020 to accommodate the lessons learnt during implementation of the first edition approved in December 2017

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Improved strategic analyses conducted and knowledge products developed to illustrate the evidence base for cooperation needs and challenges	Number	0.00 01-Jul-2014	4.00 30-Jun-2019		4.00 30-Jun-2021

Comments (achievements against targets):
SADC Drought Risk Assessment, Big Data Analytics, Groundwater Assessment & Malawi Deep Aquifer Study

Component: C: Advancing knowledge & information-sharing on transboundary and national groundwater

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of joint activities conducted with international groundwater organisations	Number	0.00 01-Jul-2014	25.00 30-Jun-2019		25.00 30-Jun-2021

Comments (achievements against targets):
21 activities: UNESCO-IHP (2No), IWMI (2No), USAID (2N0), EU (JRC) (1No), RWP (1) and GWP-SA (1) AMCOW et al launch of APAGroP in Nairobi 1-2 Oct 2019 (1) Integration of GW in RBOs French Training in Dakar, Senegal with BGR & AGW-Net (1) IGAD/WB/CIWA on exchange visit to Bloemfonteing (1) AMCOW (APAGroP) implementation workshop, (1), Technical meeting with AMCOW in April 2020 (1), Engagements with Resilientt Waters Project for project Collaboration (1), Engaged with the AMCOW for joint hosting of the Virtual Confrence (1), Tuli Karoo Workshop project progress meetings

(Collaboration with IMWI) (3), Engagement with AMCOW on hosting the 3rd SADC Groundwater Conference. A successful 3rd SADC Groundwater conference hosted in collaboration with other regional partners-IGRAC, IUCN, IWMI, Strathclyde University. Special sessions during the conference: UNESCO-IHP, IWMI, AMCOW, FAO, IUCN & Strathclyde University (1), Presented at the, Municipal Roadshow - Unlocking Water Resources for Municipal Water Supply: Groundwater options. Organised by the WRC (1) Initial discusion with LIMCOM, UNESCO-IHP on groundwater projects for the Limpopo basin (1)

13 MOUs concluded with the following: 1. South African Water Research Commission; 2. AU/N epad Southern African Network for Water Centres of Excellence (SANWATCE); 3. University of Strathclyde; 4. Southern African Research and Documentation Centre (SARDC); 5. Africa Groundwater Network (AGW-Net); 6. Zambezi River Commission (ZAMCOM); 7. Limpopo River Commission (LIMCOM); 8. Global Water Partnership Southern Africa (GWP-SA); 9. Okavango River Basin Commission- OKACOM; 10. International Union for Conservation of Nature (IUCN), 11. IWMI, 12. Danish Water Forum, 13. Cuvelai River Commission (CUVECOM).

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
# of people received training dedicated to groundwater data collection, management & sharing	Number	0.00 01-Jul-2014	120.00 30-Jun-2019		293.00 30-Jun-2021

Comments (achievements against targets):
293 people from Member States and River Basin Organizations trained on review and validation of Data Gap analyses reports, QGIS, Groundwater modelling, and Data Collection, processing and storage under the Groundwater Information Portal, Groundwater Literature Archive and Datacom projects.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised	Actual Achieved at

				Target	Completion
# of people directly benefitting from demonstration/pilot groundwater infrastructures	Number	0.00 01-Jul-2014	3000.00 30-Jun-2019		96,280.00 30-Jun-2021

Comments (achievements against targets):
The 13 national pilots funded by the sub-grant component of the current project have exceeded expectations, reaching a much higher number of beneficiaries in the excess of 96,280 than the initially envisaged 5,000. 53%% were women.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
# of research studies completed on groundwater management challenges selected by SADC Member States	Number	0.00 01-Jul-2014	7.00 30-Jun-2019		9.00 30-Jun-2021

Comments (achievements against targets):
1. GW Data Collection & Management through the DataCoM project executed by IGRAC and the IGS; 2. Groundwater Infrastructure Operation & Maintenance conducted through the GMI-PLI project implemented by Pegasys; 3. Groundwater Resilience through the GMI-PLI project implemented by Pegasys; 4. Conjunctive Water Management Report: Toward a Framework for Conjunctive Transboundary Water Management in the SADC region through the Shire project implemented through IWMI; 5. Regional Gap Analysis & Action for Policy, Legal and Institutional Development for Groundwater Management in the SADC Member States (GMI-PLI); 6. 16 National Gap Analyses & Action Plans for Policy, Legal and Institutional Development for

Groundwater Management in the SADC Member States; 7. Prioritization of groundwater priority intervention areas project (hot spot analysis); 8. Updating groundwater drought risk and population vulnerability map; 9. Hydrogeology of the Eastern Karoo Transboundary Aquifer report

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
# of people receiving training in infrastructure solutions in priority areas of Member States	Number	0.00 01-Jul-2014	180.00 30-Jun-2019		354.00 30-Jun-2021

Comments (achievements against targets):
Includes 80 trainees from miscellaneous training workshops; 23 trainees from the training on proposal writing 40 trainees from O&M of GW infrastructure Nov 2020 ; 30 participants from the Chimbiya Village Water Management Committee in Malawi training through Water Mission; 45 participants from the Whunga & Dite community garden livelihood projects in Zimbabwe trained through World Vision Zimbabwe; and 10 Mochocolate Village Water Committee members from Mozambique, 126 from the training on project proposal development

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
# of visitors to SADC GMI website	Number	0.00 01-Jul-2014	20000.00 30-Jun-2019		241,430.00 30-Jun-2021

Comments (achievements against targets):

Target exceeded ten-fold, thus demonstrating the awareness that now exists about the institute

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
% of participants satisfied with seminars and workshops conducted on knowledge transfer with 'excellent' outcome	Percentage	0.00 01-Jul-2014	80.00 30-Jun-2019		78.00 30-Jun-2021

Comments (achievements against targets):
The level of satisfaction was measured from the participants' response to questionnaires at the end of each training event and the results were used to populate the indicator. Due to challenges caused by the COVID-19 pandemic regarding travel restrictions the project had to implement relatively fewer events and only virtually.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
% of trained groundwater practioners who deemed training and manuals satisfactory	Percentage	0.00 01-Jul-2014	80.00 30-Jun-2019		78.00 30-Jun-2021

Comments (achievements against targets):
Participants completed questionnaires at the end of each training event whose results were used to populate this indicator. COVID-19 pandemic regarding travel restrictions the project had to implement relatively fewer events and only virtually.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Advanced scientific knowledge enabling sustainable transboundary groundwater management among SADC Member States	Number	0.00 01-Jul-2014	4.00 30-Jun-2019		6.00 30-Jun-2021

Comments (achievements against targets):
1. Shire TBA , 2. Eastern Kalahari TBA underway, 3. Tuli Karoo, 4. Ramotswa TBA- through Big Data Analytics, 5. Stampriet TBA- through UNESCO-IHP GGRETA and 6. Khakea/Bray

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Percentage of times on-demand technical assistance requests from SADC Member States met	Percentage	0.00 01-Jul-2014	80.00 30-Jun-2019		83.40 30-Jun-2021

Comments (achievements against targets):
An annual assessment was undertaken to get feedback from Member States. Most of the demands were from the pilot projects implemented in the respective Member States

Component: B: Strengthening institutional frameworks for sustainable groundwater management

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
# of guideline notes on policy and legislation for transboundary and national aquifers developed and disseminated	Number	1.00 01-Jul-2014	10.00 30-Jun-2019		16.00 30-Jun-2021

Comments (achievements against targets):
16 Guidelines developed: -

1. Framework for GW Data Collection & Management; 2. WRC branded guideline; 3. Guideline on Building Groundwater Resilience; 4. Guideline of GW Infrastructure Operation & Maintenance; 5. Guidance on Development of GW Policy, Legal & Institutional Roadmap; 6. Guideline for Institutionalizing Groundwater Management in SADC; 7. Guideline on Strategies for Financing Groundwater Infrastructure projects; 8. Guideline on Strategic Finance for GW investments; 9. Guideline on Strategies for Financing Groundwater Infrastructure projects; 10. Guideline of GW Infrastructure Operation & Maintenance; 11.Guideline on Strategies for Financing Groundwater Infrastructure projects; 12. Guideline of GW Infrastructure Operation & Maintenance; 13. Guidance on Establishment of National Focal Groups; 14.Generic TOR for National Focal Group; 15. Guidance on Integrating National GW Database in the SADC-GIP (using Malawi case study); 16. Guidance on Integrating RBO GW Database in the SADC-GIP (using ZAMCOM case study)

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
MoU Signed between SADC Secretariat and the University of the Free State	Text	No MoU 01-Jul-2014	MOU implemented 30-Jun-2019		Hosting Agreement signed in May 2017 30-Jun-2021

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
# of trainings dedicated to providing guidance to stakeholders on identifying solutions for strengthening legal, policy, and regulatory tools	Number	0.00 01-Jul-2014	10.00 30-Jun-2019		10.00 30-Jun-2021

Comments (achievements against targets):
1. International Water Law & Gender-28-30 Nov 2016-UNESCO-IHP, IWMI and USAID (through for 100 Participants from 12 Member States; 2. Droit international de l'eau et les instruments des Nations Unies, y compris des articles sur les eaux souterraines 21-25 August 2017 Kinshasa, DRC WaterNet, 5 participants from DRC; 3. A lei internacional sobre a água e os instrumentos das Nações Unidas incluindo artigos sobre as águas subterrâneas 18-22

September 2017 Maputo, Mozambique WaterNet & Ministério de Obras Públicas Habitação e Recursos Hídricos Departamento dos Rios Internacionais - 6 participants from Mozambique; 4. Training on Negotiation skills in transboundary surface and ground water resources management 13-17 November 2017 Dar es Salaam, Tanania WaterNet 3 Tanzanian participants sponsored by SADC-GMI to attend WaterNet organized training; 5. Validation workshops on National & Regional Gap Analyses-5 Dec 2018; 6. Validation workshops on National & Regional Gap Analyses- 13-15 Aug 2019; 7. Workshop in Dodoma, Tanzania on Roadmap development; 8. Workshop in Dodoma fo validation and adoption of Roadmap- Sep 2019; 9. All Stakeholder's Meeting for the Development of the Kingdom of Eswatini Roadmap 7th and 8th November 2019 in Mbabane; 10. SADC WRTC training and advocacy workshop on PLI products in Feb 2020

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
# of manuals produced which provide operational support for groundwater infrastructure development (including management of environmental and social impacts)	Number	0.00 01-Jul-2014	5.00 30-Jun-2019	4.00 30-Jan-2019	5.00 30-Jun-2021

Comments (achievements against targets):
1. O&M Manual for GW Infrastructure; 2. Guideline on Preparation of ESS Close-out Reports; 3. SADC-GMI ESS Reporting Protocols for Small Grant Infrastructure Projects; 4. Simplified ESMP template; 5. Training Manual & Guidelines for Preparation of GW project proposals

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised	Actual Achieved at Completion

				Target	
# of people learning applied skills from demonstration/pilot groundwater infrastructures	Number	0.00 01-Jul-2014	60.00 30-Jun-2019		65.00 30-Jun-2021

Comments (achievements against targets):
33 people trained from sub-Grantees and Member States, 23 from the training on proposals and 9 from a telemetry installation training

Component: A: Operationalisation of the SADC Groundwater Management Institute

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
# of Interns/ Seconded with the regional internship programme at SADC-GMI	Number	0.00 01-Jul-2014	45.00 30-Jun-2019		65.00 30-Jun-2021

Comments (achievements against targets):
Internships involved in the SADC Data Collection & Management project, SADC-GIP and SADC-GLA projects

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion

SADC-GMI obtains Subsidiarity Status of SADC	Text	Not obtained 01-Jul-2014	Subsidiary status granted 30-Jun-2019		Approved by 38th SADC Summit in August 2018 30-Jun-2021

Comments (achievements against targets):
MOU between SADC Secretariat and SADC-GMI was signed on 24 August 2020; Hosting and Accreditation to operate in the Republic of South Africa was also granted.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
# of sub-grant pilot activities at SADC Member States level completed with satisfactory outcome	Number	0.00 01-Jul-2014	15.00 30-Jun-2019		13.00 30-Jun-2021

Comments (achievements against targets):
13 pilots have been completed: one in Malawi, three in Botswana, three in Zimbabwe , one in Tanzania, one in Mozambique, one in Zambia, one in Namibia, one in Eswatini, one in Lesotho. One sub-grant project in Angola was dropped, and the the sub-grant projects that were planned for Madagascar , Seyschelles, DRC and South Africa were eventually not pursued by the respective governments

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised	Actual Achieved at

				Target	Completion
Strengthened transboundary institutions with improved analytic tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management	Number	0.00 01-Jul-2014	5.00 30-Jun-2019	5.00 30-Jan-2019	5.00 31-Mar-2021

Comments (achievements against targets):
5 RBOs were strengthened in various ways, viz LIMCOM, ZAMCOM, ORASECOM, OKACOM and CUVECOM which include training on specific topics, technical assistance on undertaking groundwater initiatives, knowledge transfer in Groundwater Committees, support in undertaking groundwater assessments and preparing groundwater strategies

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Financial resources sought and secured for long-term sustainability &/or expansion of operations	Text	None 01-Jul-2014	Grant revenues secured 30-Jun-2019		R 133,885,000 30-Jun-2021

Comments (achievements against targets):
Additional financial resources amounting to about $9Million secured from the new CIWA project starting in 2021. A grant of about $310k was received from JRS Biodiversity Foundation to implement a biodiversity project in Khakea/Bray TBA. The balance of the actual funds raised was sourced from,

conferences, trainings as well as rendering professional services to other institutions such as GIZ, UNESCO-IHP and IWMI. An additional grant amounting to $5Million from GEF is under preparation.

KEY OUTPUTS BY COMPONENT

Objective/Outcome 1: Development of the SADC Groundwater Management Institute into a regionally recognized center of excellence.	
Outcome Indicators	Development of the SADC Groundwater Management Institute to a recognized center of excellence
Intermediate Results Indicators	1. SADC-GMI Subsidiarity Status of SADC Granted 2. Percentage of participants satisfied with seminars and workshops conducted on knowledge transfer with 'excellent' outcome 3. Percentage of trained groundwater practitioners who deemed training and manuals satisfactory 4. Percentage of times on-demand technical assistance requests from SADC Member States met 5. Financial resources sought and secured for long-term sustainability &/or expansion of operations 6. Signed MoU between SADC Secretariat and the University of the Free State 7. Number of Visitors to SADC GMI website
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	14. Subsidiarity Status approved 15. Training for groundwater practitioners and training manuals 16. Seminars and workshop activities 17. Technical assistance to Member States 18. Secured funds/revenues 19. Signed MOU and Hosting Agreement 20. Records of Visits to SADC GMI website at closing
Objective/Outcome 2: Transboundary and national institutions strengthened to improve regional cooperation	
Outcome Indicators	Transboundary institutions strengthened to improve regional cooperation
Intermediate Results Indicators	1. Strengthened transboundary institutions with improved analytic tools, knowledge products, data, forecasting, and/or capacity for improved water and climate risk management 2. Advanced scientific knowledge enabling sustainable transboundary groundwater management among SADC Member States

	3. Number of guidelines notes on policy and legislation for transboundary and national aquifers developed and disseminated 4. Research studies completed on groundwater management challenges selected by SADC Member States 5. Number of joint activities conducted with international groundwater initiatives 6. Improved strategic analyses conducted and knowledge products developed to illustrate the evidence base for cooperation needs and challenges
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	A. 5 Transboundary Institutions (RBOs) Strengthened B. National Focal Points established C. Joint activities conducted and completed 4. Guideline notes on policy and legislation for transboundary and national aquifers 5. Scientific Studies completed 6. Transboundary Diagnostics and Joint Strategic Plans
Objective/Outcome 3: Enhanced capacity for sustainable transboundary groundwater management.	
Outcome Indicators	Enhanced capacity for sustainable transboundary groundwater management in the Ministries responsible for groundwater in SADC Member States
Intermediate Results Indicators	1. Number of trainings dedicated to providing guidance to stakeholders on identifying solutions for strengthening legal, policy, and regulatory tools 2. Number of Interns/ Seconded with the regional internship program at SADC-GMI 3. Number of manuals produced which provide operational support for groundwater infrastructure development (including management of environmental and social impacts 4. Number of documents produced on financing of construction and maintenance of groundwater infrastructures 5. Number of people received training dedicated to groundwater data collection, management & sharing
Key Outputs by Component (linked to the achievement of the Objective/Outcome 3)	**I.** Training activities dedicated to strengthening legal policy and institutions **II.** Sixty-five (65) Interns seconded in the regional internship program **III.** Operational support manuals for groundwater infrastructure development **IV.** documents produced on financing of construction and maintenance of groundwater infrastructures

	V. Training activities dedicated to groundwater data collection, management & sharing
Objective/Outcome 4: Promoting infrastructure solutions for the development of groundwater resources	
Outcome indicators	24. Direct project beneficiaries 25. Female beneficiaries
Intermediate Results Indicators	1. Number of sub-grant pilot activities at SADC Member States level completed with satisfactory outcome 2. Number of people directly benefitting from demonstration/pilot groundwater infrastructures 3. Number of people receiving training in infrastructure solutions in priority areas of Member States 4. Number of people learning applied skills from demonstration/pilot groundwater infrastructures
Key Outputs by Component (linked to the achievement of the Objective/Outcome 4)	a. 13 sub-grant pilot activities at SADC Member States level completed with satisfactory outcome b. Direct Beneficiaries of the demonstration/pilot groundwater infrastructures c. Female beneficiaries d. Training activities in infrastructure solutions in priority areas of Member States e. Beneficiaries of applied skills from demonstration/pilot groundwater infrastructures

ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

a. TASK TEAM MEMBERS

Name	Role
Preparation	
Marcus Marinus Petrus Wijnen	Task Team Leader(s)
Chitambala John Sikazwe	Procurement Specialist(s)
Tandile Gugu Zizile Msiwa	Financial Management Specialist
Ronald N. Hoffer	Social Specialist
Paula F. Lytle	Social Specialist
Stephen Ling	Social Specialist
Supervision/ICR	
Anna Cestari	Task Team Leader(s)
George Daniel, Chitambala John Sikazwe	Procurement Specialist(s)
Tandile Gugu Zizile Msiwa	Financial Management Specialist
Minerva S. Espinosa-Apurada	Team Member
Mary C.K. Bitekerezo	Social Specialist
Blessing Manyanda	Procurement Team
Alona Nesterova	Team Member
Marcus Marinus Petrus Wijnen	Team Member
Lindiwe Dube	Procurement Team
Palesa Selloane Mokorosi	Team Member
Erika Ella Auer	Social Specialist
Johanna Martina Whitfield	Environmental Specialist

D. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US$ (including travel and consultant costs)
Preparation		
FY13	0	10,332.10
FY14	19.602	158,582.42
FY15	7.170	34,002.37
Total	**26.77**	**202,916.89**
Supervision/ICR		
FY14	0	-5,286.06
FY16	11.250	62,284.83
FY17	20.938	122,113.96
FY18	25.222	124,484.15
FY19	22.277	144,079.76
FY20	29.973	119,442.79
Total	**109.66**	**567,119.43**

ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US$M)	Actual at Project Closing (US$M)	Percentage of Approval (%)
A: Operationalisation of the SADC Groundwater Management Institute	2.80	3.70	132.1
B: Strengthening institutional frameworks for sustainable groundwater management	1.50	1.60	106.7
C: Advancing knowledge & information-sharing on transboundary and national groundwater	3.00	1.90	63.3
D: Promoting groundwater infrastructure development	2.90	3.00	103.4
Total	**10.20**	**10.20**	**100**

ANNEX 4. EFFICIENCY ANALYSIS

1. The activities financed by the Project grants were predominantly focused on technical assistance, research, international cooperation, capacity building, regulation and monitoring, as well as institution building. Component D provided support to SADC Member States through the piloting of infrastructure solutions to enhance groundwater management for human and productive use. Promotion of pilot infrastructure was expected to have limited direct beneficial impact on people and economic activities, as the emphasis of the small-scale infrastructure component was to enable learning by doing, innovation and scaling up of appropriate solutions.

2. Sub-grant projects have been successful in both piloting innovation and improving local livelihoods. The 13 national pilots funded by the sub-grant component of the current project have exceeded expectations, reaching a much higher number of beneficiaries of 96,280 than the initially envisaged 5,000 of which 53% were female. They have also proved to be an effective platform for dialogue with Member States around groundwater. Assessing the indirect beneficial impact of downstream infrastructures informed or facilitated by the sub-grant component but not financed by the Project was not feasible. SADC-GMI have facilitated the implementation of small-scale projects with a degree of scalability and some positive socio-economic impacts.

Table 5: Summary of the completed sub-grant projects:

Type of intervention	Member State	Brief Description
Groundwater Monitoring	Zimbabwe	Two challenges were addressed: groundwater depletion and groundwater quality deterioration for the benefit of groundwater users and water managers. Approximately 3600 community members and local institutions benefited.
	Lesotho	Expansion of the existing groundwater monitoring network to form a comprehensive nationwide network. The project was implemented in collaboration with a wide range of stakeholders in the water sector who are also direct beneficiaries of the project.
	Eswatini	The project included monitoring existing selected wells (10 sites), development of new wells and installation of solar-powered pumps at selected sites. Pumping systems at selected schools were installed. About 66,708 people, including men, women and children, directly benefited
Groundwater Database Integration	Botswana	The project involved the integration of the National Geoscience Information (NIGIS) database model with the HydroGeo Analyst (HGA) and one web-based system accessible to the Department of Water and Sanitation and other stakeholders.
Deep Aquifer exploration and	Malawi	The project explored deep aquifers; ten communal-style water distribution points were supplied with water from a 100m borehole.

Type of intervention	Member State	Brief Description
monitoring.		15,300 community members benefited
Groundwater Development for water supply	Zambia	Identification and characterization of a local aquifer in the Chongwe area. Three additional boreholes were drilled to augment the existing water reticulation system, supplying clean water to 137,461 Chongwe inhabitants.
	Tanzania	The Project in Tanzania supports the drilling of five (5) wells for monitoring water levels. The project also supported the establishment of a groundwater abstractions register and database for the project area that indicates industrial and commercial uses for proper monitoring of groundwater abstraction.
	Zimbabwe (Legacy from earlier Project)	Rehabilitation of the infrastructure and providing communities with water through piloting drought intervention, innovative strategies, and to re-establish nutrition gardens and provide accessible water supply systems within the gardens.
	Botswana (Legacy from earlier Project)	Rehabilitation of the water infrastructure in two sites. Communities in Tsetsebjwe (2246) and Gobojango (4848) benefited from access to safe and adequate water for horticultural purposes, better and healthier diets, and improved income generated from the horticultural produce.
	Mozambique	Water supply project in the village of Muchocolate in the PA of Catembe Simbe in the Matutuine District. The project benefited key stakeholders who are dependent on water/groundwater in Namibia.
	Namibia	Review and update the Hydrogeological Map of Namibia. The project benefited key stakeholders who are dependent on water/groundwater in Namibia.

GEF Incremental cost analysis

58. The project was relevant to the GEF 5 higher-level objectives and responded to the GEF incremental cost analysis in terms of aligning with the relevant national and regional priorities. At the time of project appraisal, **S**ADC was implementing the Regional Strategic Action Plan (RSAP) III (2011 – 2015). However, with the 24 months initial delays by the time the activities started to take off in 2016**,** the project was able to fully contribute to the implementation of the RSAP IV (2016-2020) as per annex 7 of the PAD. These objectives remain relevant under the current GEF7, the project further contributed to the development of the RSAP V (2021-2025), whose implementation will coincide with the second phase of the Sustainable Groundwater in SADC Member States project Phase 2.

59. On the role of GEF funding to deliver global environmental benefits, the project supported the SADC-GMI to host the IWLearn Africa Freshwater projects workshop in Gaborone in 2019. In addition, SADC-GMI collaborated with IWLearn to produce and disseminate a prize-winning Experience Note on the Integration of Groundwater in River Basin Organizations in SADC. Moreover, through the project's support, SADC-GMI co-

manned an exhibition booth with IWLearn at the Stockholm International Water Institute (SIWI) Water Water Week in August 2018

ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS

SOUTHERN AFRICAN DEVELOPMENT COMMUNITY SECRETARIAT

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Botswana

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REF: SADC/1/17/7 **10 December 2021**

Director of Regional Integration,
Africa and Middle East and North Africa,
The World Bank,
WASHINGTON, DC,
UNITED STATES OF AMERICA.

Dear Ms. Guermazi,

RE: SUSTAINABLE GROUNDWATER MANAGEMENT IN SADC MEMBER STATES PROJECT (P127086) – IMPLEMENTATION COMPLETION AND RESULTS REPORT (ICR)

Reference is made to the World Bank's ICR pertaining to the Sustainable Groundwater Management in SADC Member States Project (P127086) whose implementation was concluded on 30th June 2021.

Having thoroughly reviewed the ICR, the SADC Secretariat is of the opinion that the Report presents a comprehensive, balanced and fair representation of the facts pertaining to the performance of the Project. The Report adequately discusses the project's results, achievements, challenges and shortcomings with frankness and objectivity and in the process bringing forward important lessons for future reference.

The timely production of this Report has equipped us to accommodate the lessons learnt as we start implementation of the Sustainable Groundwater Management in SADC Member States Phase 2 Project (P175355).

The SADC Secretariat herewith, conveys its concurrence with the assessment and findings contained in the aforementioned Report.

Yours sincerely

.....
MS. MAPOLAO R. MOKOENA
DIRECTOR FOR INFRASTRUCTURE
FOR/EXECUTIVE SECRETARY

Member States:

Angola	Eswatini	Mauritius	South Africa
Botswana	Lesotho	Mozambique	United Republic of Tanzania
Comoros	Madagascar	Namibia	Zambia
Democratic Republic of Congo	Malawi	Seychelles	Zimbabwe

All correspondence should be addressed to the Executive Secretary

ANNEX 6. SUPPORTING DOCUMENTS (IF ANY)

Project Supervision and Management Related documents:

1. Project Appraisal Document (2014)
2. Grant Agreement, GEF TF Number 016970 and CIWA TF Number 016748 (2015)
3. Aide Memoires and Management Letters of Implementation Support Missions 2015-2021
4. Implementation Status Reports 2015-2021
5. Restructuring Papers 2017-2020
6. Borrower's Project Completion Report (2021)

Guideline notes on policy and legislation for transboundary and national aquifers

- Framework for GW Data Collection & Management.
- WRC branded guideline.
- Guideline on Building Groundwater Resilience
- Guideline of GW Infrastructure Operation & Maintenance.
- Guidance on Development of GW Policy, Legal & Institutional Roadmap.
- Guideline for Institutionalizing Groundwater Management in SADC.
- Guideline on Strategies for Financing Groundwater Infrastructure projects.
- Guideline on Strategic Finance for GW investments.
- Guideline on Strategies for Financing Groundwater Infrastructure projects.
- Guideline of GW Infrastructure Operation & Maintenance.
- Guideline on Strategies for Financing Groundwater Infrastructure projects.
- Guideline of GW Infrastructure Operation & Maintenance.
- Guidance on Establishment of National Focal Groups.
- Generic TOR for National Focal Group.
- Guidance on Integrating National GW Database in the SADC-GIP (using Malawi case study)
- Guidance on Integrating RBO GW Database in the SADC-GIP (using ZAMCOM case study)

Operational support manuals for groundwater infrastructure development

1. O&M Manual for GW Infrastructure;
2. Guideline on Preparation of ESS Close-out Reports;
3. SADC-GMI ESS Reporting Protocols for Small Grant Infrastructure Projects;
4. Simplified ESMP template;
5. Training Manual & Guidelines for Preparation of GW project proposals

research studies on groundwater management challenges in the SADC Region

14. Regional Gap Analysis & Action for Policy, Legal and Institutional Development for Groundwater Management in the SADC Member States (GMI-PLI)
15. 16 National Gap Analyses & Action Plans for Policy, Legal and Institutional Development for Groundwater Management in the SADC Member States
16. Prioritisation of groundwater priority intervention areas (hot spot analysis)
17. Updating groundwater drought risk and population vulnerability map